CLAIMS

What is claimed is:

1. A system that manages central processing unit (CPU) resources in a computer, comprising:

a control component that analyzes information associated with CPU resource allocation to determine whether a process is delinquent for utilizing a percentage of CPU resources above a desired threshold percentage;

a throttling component that suspends a delinquent process for a variable amount of time before resuming the process to reduce the percentage of CPU resources occupied by the delinquent process; and

a monitoring component that monitors a delinquent process to provide real-time feedback information regarding CPU resource usage by the delinquent process.

2. The system of claim 1, the throttling component suspends and resumes an object comprising the delinquent process if the process is comprised by an object, where an object comprises at least one of a plurality of processes, a process group, and a process tree.

3. The system of claim 2, further comprising an artificial intelligence component that makes inferences regarding an appropriate adjustment to suspension duration of the delinquent process to enhance throttling efficiency.

4. The system of claim 3, the throttling component increases duration of the suspension period of the delinquent process if the delinquent process continues to occupy an above-threshold percentage of CPU resources after suspension and resumption of the delinquent process.

5. The system of claim 4, the throttling component decreases duration of the suspension period of the delinquent process if the process occupies a below-threshold percentage of CPU resources for an insufficient number of monitoring intervals.

6. A method for throttling a delinquent process that occupies more than a threshold percentage of CPU resources, comprising:

determining whether a process is delinquent for occupying more than the predetermined threshold percentage of CPU resources;

monitoring a delinquent process for a fixed time period;

suspending the entire delinquent process for a variable time period to initiate throttling of the delinquent process; and

resuming the entire delinquent process to complete throttling of the delinquent process.

7. The method of claim 6, further comprising throttling an object if the object comprises a delinquent process.

8. The method of claim 7, further comprising determining whether the process is still delinquent after throttling by comparing CPU resource usage after throttling to the predetermined threshold percentage.

9. The method of claim 8, further comprising adjusting the duration of the suspension period of the delinquent process if the process is still delinquent.

10. The method of claim 9, the magnitude of the adjustment to the suspension period is predetermined.

11. The method of claim 9, further comprising increasing the duration of the suspension of the delinquent process if the process is still delinquent.

12. The method of claim 8, further comprising determining whether the process remains below the threshold CPU resource usage percentage for a predetermined sufficient time period if the process is not delinquent after throttling.

13. The method of claim 12, further comprising ceasing monitoring of the process if it is determined that the process is not delinquent for a sufficient time period after throttling.

14. The method of claim 12, further comprising decreasing the duration of suspension of the delinquent process if it is determined the process is not delinquent after throttling for an insufficient period of time.

15. The method of claim 9, further comprising employing artificial intelligence techniques to infer an appropriate adjustment to the duration of suspension of the delinquent process if the process is still delinquent after throttling.

16. The method of claim 15, further comprising inferring an appropriate adjustment to suspension duration of the delinquent process based at least in part on the magnitude of the monitored reduction in CPU resource consumption by the delinquent process after throttling.

17. The method of claim 7, the predetermined threshold percentage of CPU resources is selected by an administrator.

18. The method of claim 17, the predetermined threshold percentage is at least about 1%.

19. The method of claim 17, the predetermined threshold percentage is at least about 5%.

20. The method of claim 17, the predetermined threshold percentage is at least about 10%.

21. The method of claim 7, performed on at least one of a terminal server, a Windows server, a non-terminal server, a desktop PC, a laptop, and a handheld computing device.

22. A method for managing process utilization of CPU resources comprising:

determining whether a process is delinquent for occupying more than a predetermined percentage of CPU resources;

monitoring a delinquent process;

determining whether an exemption from CPU throttling exists for the delinquent process; and

terminating monitoring of the delinquent process if it is exempt from CPU throttling.

23. The method of claim 22, performed on an object if the object comprises at least one delinquent process, where an object comprises at least one of a plurality of processes, a process group, and a process tree.

24. The method of claim 23, further comprising running the process for a fixed time period if the process is delinquent.

25. The method of claim 24, further comprising suspending the delinquent process for a variable time.

26. The method of claim 25, further comprising resuming the process after the suspension period.

27. The method of claim 26, further comprising determining whether the process is still delinquent after throttling by comparing the percentage of CPU resources occupied by the process after throttling to the predetermined threshold percentage.

28. The method of claim 27, further comprising adjusting the duration of the suspension period if the process is still delinquent after throttling.

29. The method of claim 28, further comprising increasing the duration the suspension period if the process is determined to be consuming a greater percentage of CPU resources than the predetermined threshold percentage.

30. The method of claim 29, further comprising increasing the duration of the suspension period by predetermined increments.

31. The method of claim 29, further comprising making inferences regarding a most effective increment of increase to the suspension period duration.

32. The method of claim 31, the inferences are based at least in part on a comparison of the percentage of CPU resources occupied by the process before and after throttling.

33. The method of claim 28, further comprising decreasing the duration of the suspension period if the process is determined to be consuming a lesser percentage of CPU resources than the threshold percentage for fewer than a predetermined number of monitoring intervals.

34. The method of claim 33, the suspension period duration is decreased by predetermined increments.

35. The method of claim 34, further comprising making inferences regarding a most effective increment of decrease to the suspension period duration.

36. The method of claim 35, the inferences are based at least in part on a comparison of the number if intervals for which the process consumed CPU resources at a percentage below the predetermined threshold percentage and the predetermined threshold number of intervals.

37. The method of claim 23, the predetermined threshold percentage is selectable by an administrator.

38. The method of claim 23, the exemption of the process from CPU throttling is based at least in part on at least one of an exemption of the process itself, an exemption of a user utilizing the process, and an exemption of the object comprising the process, if the process is comprised by an object.

39. The method of claim 23, performed on at least one of a terminal server, a non-terminal server a Windows server, a desktop PC, a laptop, and a handheld computing device.

40. A system for managing CPU resources, comprising:

means for determining whether a process is delinquent for occupying CPU resources above a selectable predetermined percentage of CPU resources;

means for monitoring a delinquent process;

means for suspending the delinquent process for a variable period of time; and

means for determining whether the process is still delinquent after suspension.

41. The system of claim 40, further comprising means for varying the duration of suspension of the delinquent process based at least in part on feedback/feed-forward information generated by the means for monitoring.

42. The system of claim 40, further comprising means to exempt at least one of a process, an object, and a specified user, from CPU throttling.